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10/512,410	10/25/2004	Susumu Hoshi	03327.2329.00000	4613

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EXAMINER

MULLIS, JEFFREY C

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/512,410

Applicant(s)

HOSHI ET AL.

Examiner

Jeffrey C. Mullis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 16-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10-25-04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claims 16-20 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 15-20 not been further treated on the merits.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "vinyl aromatic hydrocarbon block(s)" is unclear given that applicants specification utilizes mixed charges of styrene/diene such as would produce blocks having some vinyl aromatic monomer and some diene and as such it is unclear if such blocks are to be considered diene blocks or vinyl aromatic blocks. Furthermore some practitioners view blocks produced by multiple charges of mixed monomer as having a single block arising from each charge while others view the entire sequence of mixed charge derived sequence as a single sequence (note for instance Handlin and Knoll, relied upon below) and therefore it is even unclear what is intended by "block" in the context of the claims and specification. Lastly given applicants definition of "block rate",

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it is not even clear that the block referred to as "vinyl aromatic hydrocarbon blocks" etc of the claims are not the blocks of DP greater than 30 resulting from oxidative degradation as set out in the specification.

It is unclear if the "block rate" of the claims is based on the entire block copolymer or only the vinyl aromatic hydrocarbon blocks since this is not stated.

The term "molecular weight" where unqualified as to the distribution intended (ie weight or number average) or method of measurement is unclear since polymers exist as a distribution of molecular weights which vary depending on how they are expressed.

While qualification as measured by GPC is acceptable not all molecular weights in the claims are thus qualified (nor is it the necessarily the position of the examiner that support exists for reciting "GPC" where previously not recited).

The "block copolymer" claimed in the first line of the dependent claims is contradictory in that a mixture of block copolymers is recited, ie a block copolymer composition, not a block copolymer per se.

The term "vinyl aromatic hydrocarbon unit number" of at least claim 6 is not recognized and is therefore unclear.

Applicants limitation that the vinyl aromatic hydrocarbon blocks have a peak molecular weight of as much as 30,000 is contradictory to the limitation that 40-80% of the vinyl aromatic blocks may have a molecular weight of 35,000 which is even higher than the 30,000 maximum peak molecular weight.

The term "respectively" as recited by at least line 6 of page 83 of claim 3 makes no sense since the term "respectively" apply to a former and latter feature and only one

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feature is recited up until this line. In fact all recitations of respectively appear unclear in the claims including claims 4 and 5.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hall et al. (US 5,089,558).

Hall discloses a block copolymer composition having two block copolymers. Note that Hall discloses a diblock copolymer in Example "B" in column 4 having a molecular weight of 99,000 having 82.5% total styrene content having 13% polystyrene homo block (and thus a molecular weight of the homopolystyrene block of about 13,000 and thus 50% of the vinylaromatic blocks have a molecular weight of 13,000 within the metes and bounds of the claims) and remainder B/S styrene/butadiene copolymeric block. Note that examples D-E are similar except that they may produce triblock copolymers. Those limitations of applicants which are not clearly contradictory therefore appear to be met. In any case even if the examiner is incorrect, applicants limitations such as block aromatic content and molecular weight as well as the number of blocks is

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disclosed to be chosen from variables which appear within the metes and bounds of the claims no matter how interpreted as set out at column 1, lines 30-62 and column 2, lines 30-37. Hence to choose applicants limitations from the patent would have been obvious to a practitioner having an ordinary skill in the art at the time of the invention in the expectation of adequate results, absent any showing of surprising or unexpected results.

Claims 1, 2, 6, 9-15 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Handlin, Jr. (US 2003/0181584).

Handlin discloses a process for producing a block copolymer in which multiple charges of B/S mixture are polymerized sequentially in the presence of a randomizer to produce polymers with 40 and 50% styrene (see polymers 10 and 11 in Table I and the process recited in paragraph 51 as being that of 60/355,410 available in PUBLIC PAIR at the USPTO website), a process similar to that of applicants specification and therefore presumably producing polymers falling within the parameters of the instant claims.

When the reference discloses all the limitations of a claim except a property or function, and the Examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention, basis exists for shifting the burden of proof to applicant. Note In re Fitzgerald et al. 619 F. 2d 67, 70, 205 USPQ 594, 596, (CCPA 1980). See MPEP § 2112-2112.02.

Claims 1-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Knoll et al (US 6,031,053).

Patentees disclose a process for producing block copolymers in which successive charges of butadiene/styrene mixture are polymerized with randomizer present to produce block copolymers having applicants styrene content, a process similar to that of applicants specification and therefore presumably producing products similar to applicants. Note Table 1 in this re. Note that coupling agents are added in some of the examples at the paragraph bridging columns 6 and 7, a process known in the art to be inefficient and result in mixtures of coupled and substantial amounts of uncoupled block copolymers thus embracing applicants claims apparently requiring at least two block copolymers.

When the reference discloses all the limitations of a claim except a property or function, and the Examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention, basis exists for shifting the burden of proof to applicant. Note In re Fitzgerald et al. 619 F. 2d 67, 70, 205 USPQ 594, 596, (CCPA 1980). See MPEP § 2112-2112.02.

Claims 3-5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Handlin or Hall, cited above in view of either Broekhuis (US 4,940,756) or Morren (US6,326,127).

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The primary references do not use isoprene in their examples and possibly do not produce block copolymer compositions in which two block copolymers according to the instant invention are present in combination.

The secondary references disclose that coupling of living lithium terminated polymers is inefficient and results in mixtures of block copolymers within applicants range of 10-90 of one block copolymer and 10-90 of the other. Note '127 at column 5, lines 43-47 and example 1 and '756 at Table 7.

Production of the block copolymers of the primary references as mixtures of coupled/uncoupled would have been obvious to a practitioner having an ordinary skill in the art at the time of the invention motivated by the primary references disclosure that coupling can be used and by the secondary references disclosure of coupling processes which would meet the goal of a coupled polymer absent any showing of surprising or unexpected results.

With re to choice of isoprene from the primary references, choice of such would have ben obvious to a practitioner having an ordinary skill in the expectation of adequate results, absent any showing of surprising or unexpected results.

Any inquiry concerning this communication should be directed to Jeffrey C. Mullis at telephone number 571 272 1075.

Jeffrey C. Mullis  
J Mullis  
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JCM

10-1-05

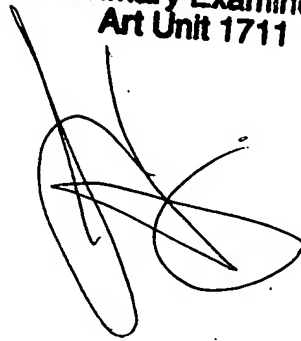


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**Jeffrey Mullis**  
**Primary Examiner**  
**Art Unit 1711**

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